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AND PEDIC ITEMS

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JOURNAL of the NATIONAL ASSOCIATION of CHIROPODISTS

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Vol. 20. AUGUST, 1930. No. 8.

UNUSUAL FOOT DEFORMITY

BEN LEVY, M. CP.
SCHENECTADY, N. Y.

This odd type of foot deformity is presented at the suggestion of Otto F. Schuster, who examined the X-ray negatives.

The patient, a woman, 56, presented herself for relief of pain from helomata at tip of second and third toes of the left foot and bilateral symptoms of weak foot.

Subjective—At about the age of 10 years the family physician had separated the second and third toes of the left foot, which were webbed. She does not recall foot trouble previous to that event. Since then has had trouble in fitting shoes, and has not been free from discomfort while bearing weight. In later life, with added weight, the condition became gradually worse. The usual commercial props and shoes were tried without success.

FIGURE I.
Externally, the deformity is most noticeable in the second toe.

Objective—Second and third toes, with their interphalangeal and metatarsal articulations (see Fig. 2), hypertrophied and ankylosed, except for a very limited extension of the toes. There is also a slight compensatory enlargement of the metatarsal shafts (second and third) from excessive weight bearing. There are osteomata spongiosa in the intermetatarsal space. Size of the second and third toes increased to that of the first toe, with the tip of the second toe larger than the first. There is an extreme flaccid weak foot (bilateral).

Treatment—Advice of orthopaedic surgeon, to whom the patient was referred, was to avoid surgical measures if mechanical means could be employed for relief. The right foot was fitted to a combination Whitman brace, and instructions on posture and exercise were, of course, limited to this foot. The Whitman brace fitted to the left foot was modified with an anterior extension, made long enough to prevent motion at the metatarsophalangeal region; cupped at the second and third enlarged articulations, to remove painful pressure. A light-weight kid welt flexible shank shoe with broad toe was obtained after some difficulty.

Comment—(Otto F. Schuster) The condition would appear to be a traumatic origin, since it is limited to two toes and metatarsal bones. I have looked up my reference books for an explanation of the condition,

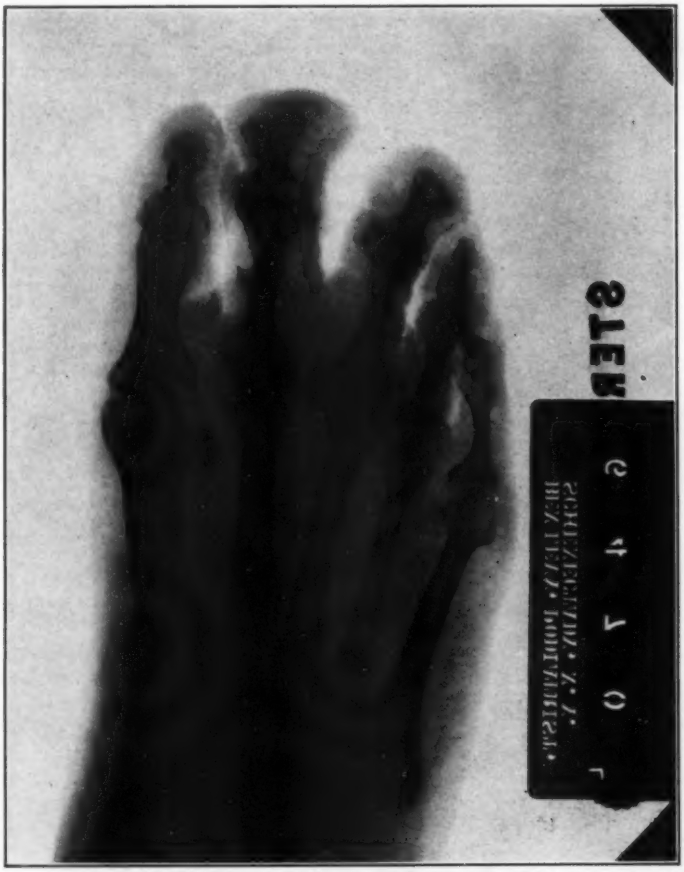

FIGURE II.

Second and third toes with their interphalangeal and metatarsal articulations hypertrophied and ankylosed. Note the fusion of the distal and median phalanges of the second toe and the absence of the median phalanx in the third toe.

but can find nothing similar. Most interesting to me are the bony changes in the distal phalanges. The osteomata in the intermetatarsal space are not so unusual.

(Levy) The surgeon to whom the patient was referred advised her to accept the treatment outlined, and after a period of four months' use of the plates, this course seems to have been entirely justified.

621½ STATE STREET.

FRACTURE OF SESAMOID BONES OF THE FOOT

With Report of a Case

MARCUS H. HOBART, M.D., F.A.C.S.
EVANSTON, ILL.

The following case report is of special interest because so few similar cases have been reported in the literature.

CASE REPORT

December 4, 1926; C. H., white, male, aged forty-two years, a painter, came to the Cook County Hospital with the following history: Four days previously, while working on a ladder on the side of a house, he stepped down from one round of the ladder to the next. The next round of the ladder, however, was missing, and his foot came down forcibly upon the second round, striking the ball of the foot under the great toe with resulting sharp pain in that region. Upon walking, the pain was so severe that he consulted a doctor, but was not relieved. Accordingly, being only a poor painter making from ten to fifteen dollars a day, he repaired to the County Hospital, where upon examination he was found to be tender on the plantar surface of his foot under the metatarso-phalangeal joint.

The X-ray showed the fracture of the fibular (outer) sesamoid. The fact that no case of congenital division of the fibular (outer) sesamoid bone has been reported, made the diagnosis of fracture in this case more certain.

The patient was put in a plaster of Paris cast, extending from beyond his toes to the knee, and was told to use crutches. The cast was not split as there was no swelling. He was told to report if any adverse symptoms arose, and at least once a week otherwise. The cast was split after four weeks, and gradually the foot was released. At the end of six weeks no pain or tenderness was present, and the patient could walk with ease and comfort.

Fracture of the sesamoid bones of the foot was noted in animals before any was reported in man. Schunke, in 1901, was the first to describe a fracture of these sesamoids in humans.

In 1912 Muller collected sixteen cases from the literature, including one of his own. In one the fibular or outer sesamoid was involved, in nine the tibial, and in five a division was found in both feet.

Orr collected twenty-four cases of fracture of the sesamoids up to 1918. Since that time there have been several articles and reports on fractured sesamoids of the great toe.

Delangeniere, in an article on fracture and treatment of the internal sesamoid of the great toe, found no cases reported in the literature before that reported in 1909 by R. Morian. He cites a case of fracture of the internal sesamoid, treated successful by removal of the bone. He had two cases of the same bone fractured and similarly treated.

In the discussion following this paper, Mouchet observed that the diagnosis of a fractured sesamoid bone should be very guarded, because there are many anomalies of the internal sesamoid showing bipartite and exceptionally tripartite sesamoids.

Koch reported two instances of fracture of a sesamoid bone of the great toe treated by rest, early massage, and hot air.

E. Muller gives a case of a fracture of both sesamoids of the big toe.

Bizarro reports two cases of sesamoid fracture, on a T-shaped fracture of the fibular (outer) sesamoid which showed bony union by an X-ray six months later. He collected sixty cases from the literature in

which six were fractures of the fibular sesamoid, one was of both, and the rest were tibial (inner) sesamoids.

Brugman discusses fractures of the sesamoids as a source of pain around a bunion joint.

A fractured sesamoid without trauma is quoted by Hernaman-Johnson. One might think of a congenital condition in this case.

Freiberg discusses injuries of the sesamoid bones of the great toe in the Journal of Orthopaedic Surgery in 1920.

Other writers in the Archives of Radiology and Electrotherapy (London) in 1918 discuss fractures and congenital aspects of these sesamoids.

In considering the etiology of these fractures the mechanism is not always clear. On the cadaver it has been proven that forcible dorsiflexion and abduction of the great toe may give rise to fractures of the tibial sesamoid, and marked comminution may come from hammering on the foot, with or without the shoe on. The cause may, therefore, be either direct or indirect violence, and usually comes from a sudden fall upon the feet or a heavy weight dropping upon the toe.

Roberts and Kelly give the usual causes as resulting from direct violence—as jumping on the toes, run-over accidents, sudden falls upon the feet, and the impact of falling objects on the foot, stepping off stairs and causing extreme toe hyperextension, hitting foot against a rock while running, dancing, or skating accident, catching the foot in a hole, or making a false step on uneven ground. Most authors agree that the cause is usually direct violence.

Speed summarizes the causes as follows:

(1) Direct violence due to the fall of heavy objects upon the foot.
(2) Squeezing the hallux between heavy masses.
(3) Fall from a height on to the foot.
(4) Sudden increase in weight-bearing force, when carrying heavy weights.

An association with hallux valgus is often found.

The symptoms are usually those of a sudden sharp pain at the time of injury and following some of these accidents, and is due to a low-grade inflammation of the adjacent joint with which the sesamoids are in the most intimate relation. The pain is located in the region of the sesamoid bones, and is associated with movements of the metatarsophalangeal joint of the great toe; it may be less or absent on rest, but returns on walking. The pain is persistent on walking on the plantar surface of the foot over the sesamoid region, so that the patient will often walk on the outer side of the foot. Tenderness is associated with the pain, and is located over the sesamoid, is elicited by walking or direct pressure on the plantar surface.

Perhaps the most interesting and important part about the fracture of the sesamoid bones of the foot has to do with the diagnosis, and whether or not there is really a fracture present. The chief cause for confusion is the fact that congenital separation or non-union of the sesamoid bones occurs. The inner or tibial sesamoid is congenitally transversely divided in four per cent of cases; an extra sesamoid is present in perhaps one per cent. The outer sesamoid was not seen congenitally divided in 100 cases. As a rule, these congenital conditions show a smooth, rounded, and regular shape in the parts, while the fracture edges

are dentate, irregular, and may be in any direction. The congenital are usually transverse, rarely oblique or longitudinal. The degree of separation is more apt to be greater in fractures. These conditions may be reversed, and pain may also be associated with the congenital type.

In making a diagnosis of fracture of the sesamoid, the history of the sudden sharp pain at injury with continued resulting pain and characteristic tenderness in a previously normal foot, and the X-ray are the most important points. An X-ray of both feet should be made for comparison, and the line of cleavage, its degree of separation, and character should be noted. The foot may be slightly swollen about the great toe joint and tenderness should be elicited by directed pressure with the thumb or finger over the fractured bone. If after proper treatment the symptoms have gone and X-ray shows union of the fracture, the diagnosis is assured. Of course, if there happened further to be an X-ray showing a normal sesamoid previous to the injury and symptoms, the diagnosis is certain.

The prognosis is good with proper treatment. Six to eight weeks should give a perfect recovery in most cases.

The treatment is rather well defined. The patient should be kept off of the injured foot, and it should be immobilized until the fracture is healed, usually from three to six weeks. This immobilization can be done with a plaster of Paris cast, which may include the great toe. Koch recommended rest, early massage, and hot air.

If the immobilization treatment fails, or if the symptoms persist, removal of the affected sesamoid bone or bones is indicated. The operation is not too difficult. An incision is made preferably at the side of the foot, so that the plantar surface is not interfered with. In the cases reported in the literature, operation was used in many.

SUMMARY AND CONCLUSION

1. Fracture of the tibial (inner) sesamoid of the great toe, although not common, has been reported often enough since its recognition to be classed as a clinical entity.

2. Fracture of the fibular (outer) sesamoid is rare, and has been reported only a very few times.

3. Congenital anomalies of the tibial (inner) sesamoid occur in about four per cent of cases.

4. No cases of congenital anomalies of the fibular (outer) sesamoid have been reported.

5. This case of fibular (outer) sesamoid is of interest as being very unusual.

6. The diagnosis of fractured sesamoid in this case is more certain because congenital anomalies of the fibular (outer) sesamoid have not been reported; and is proved by the X-ray taken.—*Journal of Bone and Joint Surgery.*

The September and succeeding issues of THE JOURNAL will contain news of the Detroit Convention. Reports of officers and committees, proceedings of the House of Delegates, and a story of the "high lights" of the meeting will be published as rapidly as space permits.

ROMANCE OF SHOES*

HAROLD C. KEITH
President of National Boot and Shoe Manufacturers Association

Shoemaking since the beginning of history has been regarded rather as an art than as a trade; the sandal was the first known form of footwear, and many of the sandals of ancient Egypt were surprisingly beautiful. In the Victoria and Albert Museum in London there are shoes of maroon colored leather, embroidered and gilded, which were made in Egypt during the fifth and sixth centuries. Pictures of ancient Egyptian sandal makers of 1500 B. C. have been found in Thebes showing methods something like those of the modern hand shoemaker who sat upon a low bench and held his work between his knees.

Examples of beautiful footwear hundreds of years old can be found in the Guild Hall Museum in London, the Musee de Cluny in Paris, and the museum of the United Shoe Machinery Corporation in Boston. The hand or custom shoemaker has always been considered an important artisan in the various countries of Europe, but, obviously, their footwear could only be purchased by the very rich. It is to the credit of American genius and invention that beautiful, well fitting shoes were brought within the purse of all.

The moccasin of the American Indian was the first foot covering used on this continent, but the real beginning of the shoe industry in America was at Salem, Mass., where Thomas Beard and Isaac Rickerman, two expert British shoemakers, landed in 1629. Others followed, and gradually little shoe shops were established in towns north and south of Boston; these shops were usually but an ell of a farmhouse where the shoemaker and his family worked the long winters. The tanning industry also was developed in New England, and Boston became not only a great shoe center, but the greatest leather market in the world.

Soon after the Revolution, some enterprising shoemakers began to employ others to work for them, and I have heard my grandfather tell of sending shoe uppers to various farmhouses in the country to be stitched and then returned to the shops to be bottomed and finished.

Then came the advent of machinery in the industry. It had been the custom to attach heels to shoes by wooden pegs, and in 1883 a machine was invented to attach the outersole to the innersole by means of wooden pegs. This machine came into general use in 1857. At about the same time the Howe sewing machine was used to sew the uppers together.

In 1861 Gordon McKay, a capitalist and manufacturer, developed a machine invented by Lyman R. Blake, of Whitman, Mass., some years before, which sewed the sole through the innersole. This machine did more than any other to modernize shoe manufacturing. In 1871 to 1875, Charles Goodyear developed the method of sewing a welt or a narrow strip of leather to the upper by the use of a curved needle, and then the outer sole was attached to the welt. The Goodyear welt method has since become the most universally used in the industry, and produces a flexible, serviceable type of shoe.

Later the United Shoe Manufacturing Company was formed, bringing together under one management the different types of shoe machinery,

*Reprinted from the Boot & Shoe Recorder.

and they today dominate that field; they lease their system of machines to all manufacturers at the same terms, and it is one of the reasons why the shoe industry is such a highly competitive industry, and as a result prices are low, considering the value of our raw material, leather, and the skill required in manufacturing shoes.

Few buyers realize that it takes two weeks to properly make a pair of shoes, and that the average shoe passes through nearly two hundred hands in the making. No two pieces of leather are alike, and the various operations require skill of hand and brain. The workers are among the higher paid workers in industry, and justly so. Our industry is gratified that the present tariff bill, which contains a 20 per cent protection on boots and shoes, has received the President's signature. For many years our industry has had no protective duty, and from my own observation of the low labor costs in factories abroad, this protection is necessary if we are to maintain the payrolls of our industry and the American standard of living. Because of the extremely competitive nature of the industry, such a duty will not materially affect the prices of American made shoes. If there is any change in prices, it will come from the duty on hides and skins, as approximately 40 per cent of the requirements of the tanning industry must be imported from abroad.

Not only has America led the world in mass production, several units in our industry producing over 50,000 pairs of shoes a day, but our experts have developed the construction of lasts and patterns to give a variety of shapes, styles, sizes, and widths to properly fit every type and size of foot. No longer is it necessary to go to the custom bootmaker to enjoy foot comfort. Too few buyers, however, realize the importance of proper fitting. The best and most expensive shoes in the world are of little value if not built on a last suited to your foot, and are of the proper length and width. Buy your shoes where you are certain to be expertly fitted.

Men, as a rule, are careless about the appearance of their shoes, which are frequently not in keeping with the quality and appearance of their suit, neckwear, or hat. The industry has endeavored to bring this fact to their attention by the use of the slogan, "Shoes Mark the Man." On the other hand, since milady deigned to shorten her skirts, shoes have become an important part of the feminine ensemble, and our industry has searched the world for materials to make beautiful shoes—soft kids from China, snakes from India, lizards from Java, fabrics of gold and silver from Europe, and even skins of fish from the mighty deep have been made into footwear.

Elaborate designs with cutouts and inlays have added charm to shoes, and we have even returned to ancient Egypt for sandal and slipper effects. Shoes will continue to hold an important place in every woman's wardrobe. There is nothing you wear that you abuse so much or use so hard as your shoes, and remember in buying shoes you receive two units, each of which I believe contains more material value, more labor, and requires more skill in manufacture than almost any other article sold at comparable prices. Our industry manufactures good, serviceable shoes at all prices, but remember that beautiful shoes well made are not cheap. The recollection of quality remains long after the price is forgotten.

THE MUSCULAR SYSTEM AS A CAUSATIVE AND A CONTRIBUTING FACTOR IN DEFORMITIES OF THE HUMAN SKELETON

HENRY KELLER, M.D.
NEW YORK

In order to do justice to the topic under discussion it is advisable to divide the subject matter into various subheadings followed by a general summary, with concluding remarks as to how to apply that knowledge in the treatment of disease.

The following subheadings seem to me to answer the purpose:

1. The muscle: a, anatomy; b, physiology; c, kinesiology.
2. The muscle group: a, mechanics; b, gravity and musculature; c, monoarticular and polyarticular groups.
3. The interdependence of muscular and osseous systems.
4. Deformities: a, primary; b, secondary or compensatory; c, protective.
5. The role of the muscular system in each of the three types.

THE MUSCLE

Anatomy—The skeletal muscles in the human body number not less than 434, and constitute the largest part of most mammals, being about 45 per cent of the total weight. Each is a distinct organ, each a simple, independent force, endowed, since it can contract and shorten, or relax, with the power of producing motion.

This power the muscle cell shares with no other in the body. Each muscle cell has an arterial, venous, lymphatic, and nerve supply, the while constituting the motor engine. By means of the nerves extending between the central nervous system and the muscles, the force of contraction inherent in each muscle cell is so directed and regulated, as to be of greatest service in the production of movement in the body. Through the nerves, also, the combination of action of separate muscles, so as to improve power, is effected.

Composition of Muscles—Each muscle is composed of thread-like fibres, the number in a muscle varying from a few hundred to several hundred thousand. Each muscle fibre is an independent unit, having its own individual connection with the nervous system by a nerve fibre, through which it receives the influences that control its action. The fibres vary in length from two hundred to a thousand times their width, and being close together, parallel to one another with minute spaces between them for the lymph on which they feed, and into which they pour their waste products. Microscopically the muscle fibres as well as the nerves can be well seen.

In the arrangement of fibres into a muscle they are usually grouped into bundles, each bundle having a sheath, and then the bundles are bound together by a sheath of the muscle. The fibres of many muscles are joined directly to the bones, but more often there is a strip of flexible tissue called a tendon to which the fibres join and which connects them with the bone.

Each fibre is attached by its sarcolemma, and tendons are in reality formed by the fusion of all the sarcolemmas and sheaths of bundles with the sheaths of the muscles.

Muscular Action—The muscles are of various sizes and shapes, some are flat sheets, like the trapezius, others are long and slender, while some are spindle shaped like the biceps, and their function depends a good deal upon the size, shape, thickness, length and direction of the muscle fibres, and last but not least, on the origin and mode of insertion of the muscles in question.

By means of bones and joints, the result of muscular action are produced and adjusted, and the shapes and lengths of bones bear a relation to the motions performed.

MUSCLE GROUPS

In order that the human body should be in a position to function normally and with proper co-ordination, the muscles, which are the mainstay of the organism, must be in a position to work in groups. Motion of any joint depends upon the integrity of the surrounding musculature as well as their attachment to the osseous part, and the normal contraction and relaxation of those muscles provided for them. In connection with a joint such as the knee, with an extensive range of motion, the muscles are long, in contrast to those of the spine, where motion is limited.

Monoarticular and Polyarticular Muscles—Only by virtue of the intact musculature around a joint is the latter able to perform its normal functions, and it behooves us, therefore, to consider the muscles in relation to the joints. Some muscles are so inserted that by their course they are in relation with one joint only, while others are in contact with two joints, and in that way are influencing the region with which it is in immediate proximity. Thus, the hamstrings of the knee are polyarticular, because they come in contact with the hip as well as the knee between their origin and insertion, while the gluteal group of muscles are monoarticular, as it is in contact with the hip joint mainly.

On the other hand, the extensor muscles of the knee, making up the quadriceps with the exception of the rectus muscle, all of which happen to be the most powerful, are monoarticular, because they arise from the femur proper and therefore are not affected directly by the hip joint except in a minor degree. In the muscles making up the calf, which consist of the soleus, the plantaris and the gastrocnemius, the latter two are polyarticular, as the gastrocnemius is receiving its origin above the knee by two heads, one on either side of the femur above the condyles. The plantaris also originates from the femur. The soleus is monoarticular, in virtue of its proximity to the ankle joint exclusively through its joint attachments to the back of the os calcis.

The muscles acting on the foot proper are all polyarticular. The importance of this observation will be brought out in the course of the article.

Force of Gravity in Relation to the Muscles—It is interesting and instructive to note that the movement of any part of the body in order to have proper co-ordination the contracture of the muscles or group of muscles is regulated by two sets of stimuli, 1, those arising in its own fibres producing the contraction, and 2, those arising in the fibres of the antagonist group, which is supposed to relax the latter, in that way giving the former group the power to function properly. For instance, when the extensors of the knee contract, messages pass from their muscle

spindles, not only to the quadriceps motor cells in the anterior horn on the cord, but also to the cells which control the opponent group of muscles, the hamstring flexors.

It is clear, says Keith, that if there is to be no loss of power, that the work of opposing groups must be co-ordinated with the utmost nicety.

In order that one group of muscles acting on a joint should not have the upper hand over its antagonistic group, that group of muscles which is helped by gravity is the weaker group, while the group which is working against the force of gravity is the stronger group. The extensor muscles of the arm, for instance, are the weaker, while the flexors are the stronger muscles.

In the lower extremity the same holds true. The hamstrings are the stronger of the two groups. The inverters of the foot acting against gravity are all the muscles of the foot except three principals which are everting the foot, namely, Peroneus longus, brevis and tertius, while the extensor longus digitorum (communis) is an auxiliary. Those muscles which extend the foot upon the leg, or as we call it at present, plantar flexion, helping the person to support his body on tip toes, are also the most powerful muscles of the foot, i. e., the calf muscles, tibialis posticus, Peroneus longus, and brevis, assisted by flexor longus digitorum and flexor longus hallucis, while the dorsal flexion is brought about by the tibialis anticus, peroneus tertius, showing that in view of the fact that the tiptoeing position requires extraordinary resisting power, as the weight of the body counteracts the attitude, a powerful musculature is therefore needed for such action.

In movements of the limbs, the force of gravity plays a secondary part, while the muscles counteracting play the most important. In movements of the trunk, on the other hand, as pointed out by Keith, the force of gravity is almost as important as the actions of the muscles. In most every movement of the trunk, in bending forward or backwards, or in flexing the body sideways, the true moving force is gravity, and the muscles of the trunk serve merely as active antagonists. When we bend forward it is not the rectus abdominis which passes into contraction, but the muscles of the back. When we bend our bodies towards the left it is in the muscles of the right side which pass into action. The action of the muscles of the trunk act, therefore, as antagonists. They contract, and elongate as they contract.

These differences account to a great extent for the differences found in deformities of the trunk as compared with deformities of the extremities. In deformities of the extremities we always find the spastic contracture of muscles on the concave side of deformity, while in deformities of the trunk the contractures of the muscles are always found on the convex side of the deformity.

In the extremities it depends upon the strength of the muscle group around a joint as to which determines its position in a diseased state. Slight flexion deformities near a joint in acute or subacute arthritis are due to the greater power of the flexor group in its antagonism to the extensor group, and the deformity is always at the concave side of the diseased part, while in deformities of the spine due to spasticity of one group of spinal muscles, the deformities are always marked on the con-

vex side of the diseased part of the spine, and it is the convex side, where the contracture is usually most visible, where the real cause of the trouble should be looked for.

As for treatment, it is also of tremendous importance. In spastic deformities around a joint in the region of the extremities, one must always use extension in the line and direction of the deformity in order to overcome the spasm of the muscle by weights and pulleys. In the spinal column, on the other hand, one must rather correct the faulty gravity line which is the cause of the contractures of the muscles on the other side of the column, and eventually the relaxation of the contracted muscles will take place.

I think, also, that the reason for the preponderance of anterior and internal bowing in the lower extremities of children suffering from rickets can be found in the fact that the muscles comprising the posterior group which are to extend the foot, and the inverters of the foot, are the stronger muscles, and hence, when the bones are soft and pliable those muscles are capable of producing the mischief due to the natural weakness of the antagonistic group. Indeed, in many of the anterior curves of the legs in children, the shortness and the tightness of the calf muscles is such that, unless a tenotomy of the tendo Achilles is done, no correction of the deformity is possible, even after a complete osteotomy of both bones of the legs has been performed.

McKendrick, in discussing the problem of attitude of joints in inflamed conditions, remarks that "if a joint is inflamed, it is held in a characteristic position, which depends to a great extent upon the relative strength of the muscle on either side of it. The muscles which bend a joint, with few exceptions, are stronger than those which straighten it. Most joints when inflamed are therefore held in a bent position. The wrist, the forefinger, and the thumb joint are held straight, however, because the muscles on either side of these joints are of equal power.

Though ordinarily the flexors of joints are, as a rule, stronger than the extensors, in the spine this rule does not hold good. To prove this for yourself, it is only necessary for you to lie flat on your back with the hands above the head, and even though the feet are fixed, you will find how difficult it is to rise in a sitting posture.

The extensors of the spine are the muscles employed in weight lifting. If the joints of the spine are inflamed or injured, the erector spinæ muscles, on account of their great strength, should pull on and exaggerate the lumbar curve, lordosis. It will be remembered that the dorsal curve is practically fixed normally.

RELATION OF BONES TO MUSCLES

By means of bones and joints, the results of muscular action are produced and adjusted, and the shapes and lengths of bones bear relation to the motions performed. Bone is dominated by muscular function, for that it is called into being; with the disappearance of that necessity also disappears the bone.

Murk Jansen, in discussing bone formation, points out the following valuable facts: "As soon as side pressure adopts the character of muscle function, bone tissue is formed in the direction of the pressure, either detached from the bone, in the forms of bones lying in the tenddon (sesamoid bones), or connected with the bone in form of promi-

nences (tuberosities, trochanters). The jerking pressure of muscles in connection with that of gravity appears to be a mechanical stimulus which promotes bone formation, at least in the bones of the extremities and the vertebral bodies. Not only on the form, but also on the size of bones, the jerking pressure of muscle action and gravity seems to have an effect. At least, we observe an unmistakable parallelism between the intensity of that pressure, and the length of the extremities and their parts, both in animals and in man."

After a further discussion of the subject, Jansen concludes that not in the jerking pressure of muscle action and gravity as such, but rather in the pressure of function, functional pressure, the stimulus for bone formation in the various skeletal parts is to be traced.

It is ,therefore, self-evident that the function of muscles will have direct influence upon the bony growth, and that wrong pull of any group of muscles will sooner or later produce permanent deformities in proportion to the age of the patient, as well as the intensity and the length of time that the pressure function, normal or abnormal, has been permitted to last.

The importance of that conclusion lies in the fact that, whenever possible, early restoration of function of a paralyzed limb should be instituted, in order to encourage normal growth in the restored part, and produce pressure function in the normal and natural way.

I have under my care a girl of nine whose shortened limb, produced by infantile paralysis in early childhood, has taken on flesh and length, after a stabilizing operation on her ankle, done nine months ago, has again restored the normal stress and strain on the surrounding joints. It is indeed remarkable how nature will work, provided intelligent assistance is given it.

DEFORMITIES

In speaking of deformities, I consider it best to subdivide them into three groups, as follows: 1, primary; 2, secondary or compensatory, and 3, protective. In this way we can take up each group by itself and try to ascertain the influence of the surrounding musculature in its production or persistence.

1. *Primary Deformities*—These may be classified as congenital or acquired, the former meaning that the patient has been born with the deformity, while the latter means that the deformity made its appearance after birth. A club foot, for instance, may be present from birth, and is then called congenital. If, on the other hand, as a result of paralysis, the foot assumes a talepic attitude which sooner or later becomes a permanent deformity, we call such deformity an acquired deformity.

Nature, in an attempt to correct an anomalous position which has a tendency to embarrass the normal function, is at times over zealous in its attempt, and produces a secondary deformity, which may perhaps be of greater severity than the primary. On the other hand, it often happens that the secondary deformity has a salutary influence upon the disturbed gravity line, caused by the original deformity, with the result that the physician, which is intelligent enough to recognize nature's attempt and encourage it, will be rewarded with results equally satisfactory to the patient and physician.

There is a third group of cases, in which, as a result of certain in-

flammatory conditions or traumatism, the attitude assumed by the tissues in the immediate locality will be a protective one, and if this protective attitude is permitted to continue indefinitely it will eventually become a permanent deformity. Many an equinus deformity of the foot have I encountered, due to short calf muscles caused by trauma of the heel which made the patient walk on his forefoot, thus encouraging a contraction of the calf.

McKendrick, in speaking of the difference between attitude and deformity, says that by attitude is meant a posture assumed by the patient, natural or acquired, but which may be made to disappear on manipulation, or which does disappear of itself during sleep or under anesthesia. By deformity is meant an abnormal posture which is permanent, more or less fixed, and which does not disappear with unconsciousness.

The Role of the Muscles in the Various Deformities—In looking into the question impartially, one is struck with the fact that in primary congenital deformities, such as club foot, one finds such a preponderance of varus deformities that one must immediately ask himself the question as to why this is the case. Thus, Tubby in speaking of club foot, gives the following valuable statistics.

The compound forms of varus deformans in their order of frequency are::

1. Talipes equinovarus—foot pointing downward and inward.
2. Talipes calceneovalgus—foot pointing upward and outward.
3. Talipes equinovalgus } uncommon
4. Talipes calcaneovarus }

Taking 903 cases of club foot from his hospital work:

TABLE I—VARIETIES OF TALIPES

	Cases
Talipes equinovarus	382
Talipes equinus	125
Talipes calcaneovalgus and equinovalgus	104
Talpies varus	77
Talipes valgus	74
Talipes plantaris	57
Talipes calcaneus	47
Talipes arcuatus	37
Total	903

In other words, the dorsal flexion in inverting deformities make up 584 out of a total of 903 cases.

Whitman, in speaking of the relative frequency of the different forms of congenital talipes, gives the following statistics:

TABLE II.—RELATIVE FREQUENCY OF CONGENITAL TALIPES

	Cases	Percentage
Equinovarus	1,629	77.4
Valgus	144	6.8
Varus	89	4.2
Calcaneovalgus	87	4.1
Equinus	49	2.3
Calcaneus	47	2.2
Equinovalgus	35	1.6
Cavus	5	
Valgocavus	1	
Equinocavus	1	
Different deformity in each foot	54	

Further statistics of great interest given by Whitman as to the relative frequency of the different forms of acquired talipes, together with the etiology, are given in Table III.

TABLE III—RELATIVE FREQUENCY OF ACQUIRED TALIPES WITH ETIOLOGY

Forms of Talipes	Spinal Ant. Poliomyelitis	Cerebral—Hemiplegia	Cerebral—Paraplegia	Other forms of Paralysis	Traumatism
Equinovarus	610	59	41	18	56
Equinus	469	102	50	14	43
Calcaneus	313	7	3	9	20
Valgus	205	6	10	1	37
Equinovalgus	163	1	5	1	7
Calcaneovalgus	123	1	1	1	5
Varus	68	8	3	1	10
Calcaneovarus	13	0	1	1	0
Equinocavus	38	0	0	0	2
Calcaneovarus	15	0	0	1	1
Cavus	48	1	1	0	4
Varocavus	2	1	1	6	0

TOTAL

	Cases	Percent
Anterior poliomyelitis	2,067	79.9
Cerebral hemiplegia and paraplegia	302	11.5
Traumatism	185	7.

Whitman further elucidates the statistics in Table IV.

TABLE IV—COMPARATIVE FREQUENCY OF THE DIFFERENT FORMS OF TALIPES, CONGENITAL AND ACQUIRED

Forms of Talipes	Congenital	Acquired
Equinovarus	77.4%	32.5%
Valgus	6.8%	9.7%
Varus	4.2%	2.7%
Calcaneovalgus	4.1%	4.4%
Equinus	2.3%	26.1%
Calcaneus	1.6%	12.6%

Whitman concludes that it will noted that in three-fourths of the congenital cases the deformity is equinovarus, and that the equinus and calcaneus, rare as congenital deformities, comprise more than one-third of the acquired forms.

It is necessary, however, to bear in mind that the deformities of the acquired kind brought on by the two most common causes, namely, anterior poliomyelitis and cerebral hemiplegia, or paraplegia, differ in causation, and therefore also in treatment. In anterior poliomyelitis deformities, the muscles which contract and produce the deformity are usually the healthy and unaffected muscles, which pull in their own direction unhindered and unhampered by the antagonistic group, and thence, the deformity can be looked upon as secondary to the disease, and not brought about by the disease *per se*. On the other hand, the tonicity and spasticity of the muscles which usually accompany hemiplegia or paraplegia of cerebral origin are of primary nature, caused by the removal of the inhibitory influence of the cerebral centres and, therefore, the defomity can be looked upon as of primary origin.

In other words, if there is varus deformity of the foot following a cerebral involvement, we look upon the deformity as being caused by the removal of the direct controlling influence of the motor region, the cerebrum, and hence the increased spinal tonicity of that region with a resulting contracture of the muscles supplied by the same motor tract. On

the other hand, in deformities following anterior poliomyelitis there is destruction or partial destruction of the muscle centre or a group of muscles in the spinal motor tract which prevents them from responding to its reflex call, and hence the other antagonistic group, which under healthy conditions is partly inhibited by the group, now paralyzed, contracts without hindrance, and if allowed to remain in that attitude for a long time, the deforming attitude becomes permanent, with the result that it eventually becomes a deformity.

In the congenital deformities, therefore, it is the foetal position in utero, or some biological defect which hinders the muscles of the defective region from stimulating normal growth of the bone, and the shape is also interfered with, due to the lack of stress and strain in the relaxed region or convex part.

All the contracture is rather in the direction of the part already contracted, and the muscles which are usually the stronger, as the inverters of the foot, once they are contracted help to maintain the varus deformity, with the result of the presence of a permanent contracture at birth, which takes a good deal of time as well as great ingenuity to correct. In acquired deformity, on the other hand, one must investigate as to whether he is dealing with a spastic or flaccid deformity, also whether the tonicity of the muscles with the consequent deforming attitude assumed by the limb is on the side of normal, over-stimulated muscles, or on the side of the unhindered muscles. Is gravity helping the muscles which are at present in a state of contracture, or are the muscles contracting against gravity? It is according to these observations that one is really in a position to determine the method to be instituted in order to remedy the condition. The thing essential to remember also is the fact that with very few exceptions we have only one group of muscles paralyzed without affecting other muscles or groups of muscles, also that many muscles are really not fully paralyzed, but only partially so, or only stretched, and, therefore, embarrassed in function, which we call paresis.

With regard to the distribution of the motor disturbances, the more exact the method of examination, the more will the clinical phenomena be found to correspond with the modern pathological findings from experimental and human postmortem data. The muscle tests show that the distribution of the paralysis is more widespread than ordinarily supposed, and confirms the observation that the loss of motor function is much more often partial than total.

Paralysis of the gastrocnemius muscle, e. g., is frequently spoken of as a clinical condition, but real paralysis of the muscle alone occurred only twice in 177 cases carefully measured other muscles being weakened also. This fact is of great importance in formulating treatment.

Upon the exact condition of the surrounding musclature in a limb which is stricken with paralysis depends the results of treatment, whether conservative or operative, and also the knowledge of the strength of the various normal muscles to be substituted for the paralyzed ones is obviously essential, in order to determine the number of muscles one can and one must substitute for the one put out of commission by the disease. The amount of work done by a contracting muscle is a combination of two elements of equal importance, the amount of force used and the dis-

(Continued on Page 33.)

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WHEN AUTUMN COMES

August is here! Summer is past the half-way mark, and despite heat waves and sunburn, thoughts begin to turn to autumn and the resumption of full-time office hours.

Our suggestion last month that what chiropodists need most are longer and freer vacations brought forth some interesting reactions from a number of our readers. One thought that the Editor should mind his own business, and not trouble to suggest vacations to those of his colleagues who were too important to the community to get away "even on Sunday." Another—here's a fellow with a sense of humor—crashed through brightly with the request for a loan to enable him to act upon our suggestion.

The capable editor of the Pennsylvania Society *Bulletin*, Frank Carleton, got so het up over the idea of long vacations for frayed nerves and rutted minds that he smoked a pill and worked up his brain-child, Ole John Legion, into another fever of introspection—a fever that will spread infection (we hope) among the readers of that monthly.

But whether you have had wisdom enough to spend a considerable part of the summer away from the work-bench, or whether you've been dragging out the dog-days in full harness, now comes the autumn, with its increased work schedule and longer hours. What have you to offer your patients that you didn't have when they went away summering, and what for yourself?

Those who are now attending the Detroit Convention will bring back new enthusiasm, a freshened outlook, a lighter heart, and a stimulated mind—and the members who attend our annual meetings are

usually those who have the ability to apply all these to the benefit of their patients and to themselves.

The autumn is an excellent time to institute changes in your office. New equipment, perhaps? An increased fee schedule? A layer or two of fresh paint to brighten things up for the gloomier days to come? And, too, it is just possible that a few changes, minor ones, of course, in *you* may help to keep pace with the brisk weather and the brisker—we hope—practice that are to be expected after Labor Day.

Let's all resolve this autumn to put more into our work and the advancement of our profession than we ever have before. Make up our minds now that we have more or less "soldiered" on the job, and that we are going in with a vin and a will to accomplishment that has been lacking in other years.

Make the 1930-31 winter one long to be remembered for the many improvements you have made in yourselves and in the general structure of your profession. No progress can be at top speed unless everyone is helping. You have done your "bit" before—willingly and successfully—now do it again, urged on by renewed enthusiasm and a stronger desire to contribute even more to the general welfare of chiropody.

"There is more universal education and less culture in the United States than in any enlightened country in the world. The most serious charge that can be made against our educational system is that it furnishes us meaningless knowledge, it shows us instruments but does not teach us how to use them. Compulsory literacy makes for standardization of thought and is prejudicial to mental exploration. It turns out a one-pattern mind. That is one reason why it is so easy to get anything under way in this country, whether it be a neo-platonistic revival or a drive to build a cathedral. Schools and colleges teach us how to read, but not how to think; how to write, but not how to express our thoughts; they supply us with facts, but they do not show us how to apply them to solving the problems of life. They should teach us how to think, how to externalize thought, and how to use it to increase our happiness. The customary objective of education is to enhance our money-getting efficiency. It is probably the same the world over. . . . One hears much talk about education as a humanizing agency, that it facilitates humane, social and public service. It comes chiefly from Rotarians and professional uplifters. Hypocrisy, bigotry, and crime have reached their high water mark in the country that is most lavish of educational facilities."—From *The Doctor Looks at Love and Life,* by Joseph Collins.

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BUREAU OF PUBLIC INFORMATION

As a department of the N. A. C., the work of this bureau for the year 1929-30 has been completed. As individuals we continue to be interested in educating an interested public to the importance of the care of the feet.

When the annual reports are read in the House of Delegates at Detroit, your section of the country may or may not show up as gaining a fair amount of publicity during the past year. The success in your neighborhood depends entirely upon the amount of effort that you have put into public information. The annual report will point out some localities where a great work has been accomplished, others where little of value has been done.

As a bureau, we were organized to serve every affiliated Society of the N. A. C., but when we were confronted with the problem of finding in some States a lack of interest and a lack of working members, little remained for us to do other than to serve the cities and towns within the territory of the Society in a general way.

For this reason your estimate of the success of our work should be based upon how much you did to publicize your community. If you have failed to respond to the urgent requests of this committee, we suggest that you give future committees the co-operation they so rightfully deserve.

Chiropody in the years to come depends upon your effort this year. Sponsoring adult education is the all-important factor.

UNITED STATES HAS LARGEST RATIO OF PHYSICIANS

The Bureau of Education of the United States Department of the Interior has issued a statement on medical education, prepared by Dr. Nathan P. Colwell, Secretary of the Council on Medical Education and Hospitals of the American Medical Association. There are 149,521 physicians in this country in a total population of 118,127,654. The ratio is 126.59 physicians per hundred thousand population, a greater ratio than in any other country. The District of Columbia leads in the United States in the supply of physicians, having 34.22 per 10,000 of population; California follows with 19.97; then comes Colorado with 16.81; Nevada with 16.66; New York with 16.31, and so on down the list to South Carolina, which has the least ratio, with 7.09 physicians to each 10,000 of population. Graduates from medical schools in the United States increased in the two-year period, 1926-1928, from 3,962 to 4,262. During this time the number of medical schools recognized by the American Medical Association has been reduced by six.

The capacity of the medical schools, however, has been increased by the construction of enlarged plants. In the the last twenty years new medical school buildings or enlarged teaching hospitals have been erected by at least forty-eight schools. Reports from sixty-three of the seventy-four recognized medical schools for the year 1926-1927 show that they had a total income of $11,983,783, and an expenditure of $11,308,800. The average amount paid that year by each student to the schools reporting was $254. The average expenditure by the school was $704 per student. Of the total expenditures of the medical schools, 48 per cent, or $5,469,214, was for instruction. In the last sixteen years, 67,198 students have enrolled in medical colleges, and 82.6 per cent of them have graduated. During 1928, there were 20,545 students enrolled in the medical colleges recognized by the American Medical Association.

CLINIC BIG HELP TO TRAFFIC MEN

Police Chief Praises Free Treatments Given

Although Elizabeth patrolmen traverse various kinds of pavements, and traffic patrolmen remain for hours in one place, not a single member of either branch has lost a day on account of foot ailment since the establishment of the Elizabeth Police Foot Clinic by Dr. George J. Devo, of 1165 East Jersey Street, on May 25th, 1928, Chief of Police Michael J. Mulcahy said today.

The regular and uninterrupted performance of duty by the patrol and traffic divisions is attributed to Dr. Devo's clinic, which is free to the city's policemen.

Since the establishment of the free clinic, sixty-five policemen have been treated, according to Chief Mulcahy, who estimates the value of Dr. Devo's services at $745.50. The following treatments were given during the two-year period: Chiropodical, 79; massage, 19; electrical, 17; operations, 5; blood tests, 7; strappings, 41; medicine, 17, and arch, 15.

Records reveal that traffic men visit the clinic more frequently than members of the other branches of the service. It is pointed out by the Board of Police Commissioners, which also lauds the work of Dr. Devo, that traffic policemen remain in one spot for sometimes as long as eight hours without being able to exercise their feet, and that bluecoats patrol their beat at a slow gate, which also robs their feet of the right kind of exercise.

Records also show that the younger members of the department are treated mostly for corns and callouses, while older members seek treatment for more serious ailments.

If members of the department, who discover they have minor feet ailments, visit the clinic regularly there will be no serious trouble, Chief Mulcahy said.—Elizabeth (N. J.) Daily Journal.

ABSOLUTELY

Identity of the young lady is withheld, but the memory of her answer lingers on with the instructor conducting a science course at a local high school. One of the requirements in the written quiz was: "Define a bolt and a nut, and explain the difference, if any." The girl wrote:

"A bolt is a thing like a stick of hard metal such as iron, with a square bunch on one end and a lot of scratching wound around the other end. A nut is similar to the bolt only just the opposite, being a hole in a little chunk of iron sawed off short, with wrinkles around the inside of the hole."

The startled professor marked that one with a large "A."

Crazed with pain following an amateur surgical operation on his foot, John F. Nichol, 50 years old, 299 Fourteenth Street, Northeast, turned on the gas in the kitchen of his home early yesterday and ended his life. Coronor J. Ramsay Nevitt issued a certificate of suicide.

Nichol had been unable to work for the past several weeks because of pain caused by a growth on one foot. Sunday night he told his wife that he was going to remove the growth. She advised him not to, she said. After she went to bed, Nichol went to the bathroom of his home and, using a knife, cut away the growth.

A pool of blood on the floor indicated, physicians said, that Nichol must have suffered intense pain. A trail of blood led from the bathroom to the kitchen, where Mrs. Nichol discovered her husband's body when she arose yesterday morning. Nichol had been employed here as a baker for twenty years. He came to this country from Germany twenty-eight years ago. He is survived besides the widow by three sons.—Washington Post.

STATE SOCIETY NEWS

CALIFORNIA

The eleventh annual convention of the California State Association of Chiropodists was called to order on May 30th, 1930, at 10:00 A. M., at the Hotel Oakland, Oakland, Calif., with the President, Dr. H. J. Riegelhaupt, in the chair.

After the invocation by Rev. W. W. Bustard, the assembly listened to an address of welcome by Hon. John L. Davis, venerable Mayor of Oakland, who is not only an enthusiast for the city which he represents, but also for the profession of chiropody.

Thomas Lenehan was unanimously accorded honorary membership in the State Association, his name having previously been submitted at the last convention by Dr. G. Earle Whitten, Chairman of the Legislative Committee, for this distinction because of his invaluable assistance in furthering the successful activities of this very important committee.

Dr. I. C. Gobar, President of the College, and Dr. A. A. Gottschalk, Dean of the College, addressed the convention on college activities, as did Drs. Samuel A. Goldman, Percival Spouse, and Hilario Marquez of the College faculty.

The new ruling concerning the number of officers to be elected from the Northern and Southern divisions was made public. It is based on membership quota, the Bay Counties Division being allowed eight officers and the Southern Division seven.

Dr. Baxter Ham, Chairman of the By-Laws Committee, after careful study in conjunction with his colleagues, presented for the convention's approval many important changes in the By-Laws, which were made effective and ordered printed.

Los Angeles was selected as the next convention meeting place for 1931, and the National Association was invited to hold their 1931 convention in the same city.

Dr. R. H. Pyle, orthopedic surgeon, located in Los Angeles, was nominated for honorary membership in the State Association, and in accordance with the usual procedure he will be granted this honor at the next State Convention.

The following officers to serve for the new term were duly installed:

President—Dr. Donald F. Kimball, Los Angeles.
First Vice-President—Dr. Ray E. White, Oakland.
Second Vice-President — Dr. Roy Roscamp, Los Angeles.
Third Vice-President—Dr. Alma P. Dalbey, San Francisco.
Secretary-Treasurer—Dr. G. Earle Whitten, Oakland.
No. California Board of Directors—Drs. Harry B. Banks, Clyde Raphael, Frank M. Shay, James Morse and Vera Williamson.
So. California Board of Directors—Drs. William F. Leck, H. R. Fitzhenry, E. T. Milser, Richard Hazelhurst and Emma Anderson.

The business of the convention being disposed of, the delegates and their friends attended the dinner-dance, which was thoroughly enjoyed. It was at this affair that the news of Dr. Earle Whitten's recent marriage to Dr. Vida Bradley finally leaked out, the happy couple receiving an electric waffle iron as a belated gift from their well-wishing friends in the profession.

Saturday, May 31st, was a day replete with activities. Phi Epsilon Delta held its annual convention breakfast; addresses on Focal Infection, Epidermophytosis, Painful Feet, and Shoes were delivered by local physicians. Dr. A. Gottlieb, of Los Angeles, made a special trip north to be present at the California College comencement exercises and to deliver his lecture on Painful Feet, and the lecture on Shoes was made by Mr. A. H. Fitschen, representing the local branch of the Shoe Dealers Association, which pledged its co-operation with the chiropody profession.

Most of Saturday afternoon was occupied by the choice of winners of the Perfect Foot Contest, who were given their prizes the Monday night following at the Oakland Fox Theatre. Nine girls were selected to receive in all thirty-seven pairs of shoes, valued at $600.00. Drs. Whitten, Riegelhaupt and Gobar handled the theatre award in manner which ensured most favorable publicity for chiropody. Motion pictures were taken during this foot contest, and the films will appear in news reels throughout the entire country.

On Saturday evening, May 31st, the bowling tournament between the North-

ern and Southern branches was held. Although the North was determined to break the South's record of two straight wins, their efforts were unsuccessful. The high score man proved to be none other than Dr. William F. Leck, of Los Angeles, who was awarded the first prize, consisting of a bowling ball and a carrying case donated by the Brunswicke-Balke-Collender Co., of San Francisco. Dr. Ray E. White was in charge of this committee, and those who participated were: North — Drs. Ray E. White, G. Earle Whitte, Clyde Raphael and Frank Wagener, and Mr. Maurice Marks. South—Drs. George W. Scherer, Jr., Charles R. Hannock, Frank Schleicher, George Scherer, Sr., and William F. Leck.

A well-attended golf tournament completed the entertainment program of the convention. Under the direction of Dr. Mary Harvey Burns, the members and guests repaired to the Oak Knoll Country Club. Following the tournament, the players partook of luncheon there to discuss the pros and cons of their ability as golfers. The men participants included Drs. Charles Hannock, winner, score 82; A. Cranston, score 83; E. T. Milner, 83; J. F. Gebhardt, 83. Dr. Hannock's prowess as a golfer caused his name to be engraved on the Association's permanent cup. The lady participants were Dr. Emra Anderson, who won first prize, consisting of a cup donated by Dr. M. H. Burns, after making a score of 93, Drs. M. H. Burns, Emma Lesoine Marks, and Minerva Lesoine Watts.

To recapitulate the work performed by the Convention Committee would be to heap praise upon its members for the unusual amount of newspaper publicity which appeared in newspapers throughout the country concerning the chiropody profession. The scientific program was excellently carried out; the actual amount of business performed by the delegates was unusually large, because not only were the Association's By-Laws amended to bring them up to date, but consideration and approval were also given to a set of rules governing the relations between the faculty of the California College of Chiropody and the Board of Trustees.

The newly elected Board of Trustees sat in joint session Saturday afternoon, May 31st, and spent considerable time in determining the recommendations to be given to the delegate to the National Convention for voting on the proposed changes to the National Association's Constitution and By-Laws. Drs. James Morse and Alma P. Dalbey were named on the Board of Trustees to fill the vacancies which occurred, to serve for the ensuing year.

CONNECTICUT

Dr. Benedict presided at the regular quarterly meeting of the Connecticut Pedic Society held Sunday afternoon, July 13th, at the Wilcox Pier Restaurant, Savin Rock, West Haven, Conn. Dr. Benedict discussed the case of illegal practitioners. A movement was made to appropriate fifty dollars each to the delegate and the alternate attending the National Convention in Detroit. Drs. Bellew and Bellwood were appointed as the committee for the Bridgeport meeting in October. The meeting adjourned early to permit an interesting talk by Andrew H. Montgomery, M.D., on common skin conditions found in the practice of chiropody. A shore dinner closed the session.

The following members were present: P. Mittau, H. Wilser, T. W. Benedict, A. Buffered, H. Noll, M. Danhauser, R. Cosman, A. E. Williams, M. A. Norton, K. P. MacCallum, E. Smith, J. Shea, T. H. Farrell, M. Campbell, H. Lugg, J. Giesolbreth, W. F. Johnston, D. C. Rasmussen, M. N. Bellwood, F. C. Nastrey, and M. V. Simko

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DISTRICT OF COLUMBIA

The regular June meeting of the District of Columbia Podiatry Society was held June 3rd, 1930, at the office of Dr. Georges. About half the membership attended.

Dr. E. C. Schutz was elected delegate to the National Convention. Dr. Charles Conrad was elected alternate.

Drs. E. Thompson and Schutz were appointed as a committee to investigate bootleg chiropodists, those unlicensed gentlemen who lower the standards of our profession, and to secure evidence is the work of the committee.

Arrangements were made to secure an instructor in electrical therapeutics for a series of lectures next fall.

At 10 P. M. the Society adjourned until next autumn.

GEORGIA

The June meeting of the Georgia Association of Chiropodists was held on June 29th, in the office of Dr. James Hamilton, 803 First National Bank Building, in Atlanta.

It was decided to hold this year's annual meeting in Atlanta on July 20th, at the Henry Grady Hotel in Atlanta.

The various committees report all in readiness for the annual meeting, and we expect the largest and best get-together we have ever had.

The Ethics Committee reported that it was necessary to request the resignation of a member for flagrant unethical advertising. The following vote resulted in authorizing the Secretary to do so.

Dr. Madebach, of Augusta, stated that his city is after the 1931 convention.

The applications of several new members were received, and referred to the Membership Committee

Dr. W. R. Broadwell, D.S.C., 1930 graduate of Ohio College of Chiropody, is now associated with Dr. G. T. Dowling, 257 Peachtree Street, Atlanta, Ga.

INDIANA
St. Joe Valley Branch

Seventeen persons were seated at the banquet table last evening in the Louis XVI Room at Hotel Elkhart, where a dinner was served to the St. Joe Valley Branch of the Indiana Association of Podiatrists. Guests were: Drs. H. M. Dill and Ray Diehl, of Fort Wayne; Dr. and Mrs. Carl Willis, Huntington; Dr. and Mrs. Jesse McCann, Valparaiso; Dr. and Mrs. L. K. Bunch, Dr. and Mrs. C. L. Snyder, Dr. and Mrs. O. Grundy, and Dr. Joseph Schindley, all of South Bend; Dr. Arnold Elson, Ligonier; Dr. Ross Kennedy and Dr. and Mrs. H. E. Wiegner, of Elkhart.

After the dinner the podiatrists went to the office of Dr. Wiegner, 232 Haynes Building, for talks by Dr. Ross Kennedy, a dentist with whom Dr. Wiegner shares an office, on "Anaesthesia," and Dr. H. M. Dill on "Verucca." Later all were entertained at the home of Dr. and Mrs. Wiegner, 1439 Kilbourn Street.

LOUISIANA

The annual meeting of the Louisiana State Chiropodists Association was held July 11th, in New Orleans, in the Cusachs Building. The following officers were re-elected to serve for 1930-31.

W. J. Perkins.....President
J. Lluza .....Vice-President
R. Mascaro ....Secretary-Treasurer

The matter of the Foot Clinic was discussed, and it was decided to wait a while on the decision of the City Charity Hospital.

The reports of the President, Secretary and the Board of Directors were read and approved.

On account of the heat during the summer months, it was decided not to have any scientific lectures and demonstrations.

After the regular routine of business the meeting adjourned.

MAINE

The State meeting of the Maine Association of Podiatrists and Chiropodists held on June 28th and 29th in Bar Harbor was one of the best in the history of the Association.

The dinner served under the able direction of J. Alden Morse, the Belmont Hotel, will long be remembered by many to whom it was the first visit to our beautiful Island.

The clear definition of our needs of protective legislation for the citizens of Maine and the future training of students who enter this field in our State, the only one in New England without it, was brought out by our speakers.

Several legislators and health officers listened with interest to this part of the program. Men and women treating the minor lesions of the foot from every centre of Maine were present as well as from New York, Massachusetts, and Florida. About thirty-five members with their families and friends were at the banquet table, and all voted to return again later in the fall with much larger attendance.

A vote of thanks was given to all advertisers and local merchants who did so much to make our visit one long to be remembered.

G. E. Moore was unanimously re-elected President of the Maine State Chiropody Association at Augusta, where the annual meeting was held on May 18th. Frank Geneva was elected Vice-President, and Alfred L. Peal Secretary-Treasurer. Myron Lewis, of Portland; Fred Porter, of Bar Harbor; E. C. Shute, of Augusta, and E. M. McLeod, of Portland, were elected members of the Executive Committee.

More than fifty members and their families and guests were present at the dinner which preceded the business session, and an address on legislative matters pertaining to chiropody was made by Thomas Leigh, an attorney of Augusta. The Bar Harbor members announced that a free clinic had been opened in their town for the treatment of municipal employees.

MARYLAND

At the annual meeting of the Maryland Pedic Association held on June 17th, 1930, the following officers were elected for the coming year: President, Althea F. Miller Vice-President, Louisa A. Voltz; Secretary, Harry P. Clifton; Treasurer, William M. Lee; Delegate, Harry P. Clifton; Alternate, Regina M. Benzinger. To Executive Committee, Augusta Fink.

The Association has had a most prosperous twelve months, and looks forward to continued activity and further progress during the coming year.

NORTH DAKOTA

The annual meeting of the North Dakota Society of Chiropodists was held in Minot on June 2nd.

The following officers were re-elected: J. A. Whitmore, President; Elva M. Glade, Vice-President, and Clara B. Westphal, Secretary-Treasurer.

The meeting was strictly business as the one day was all we had. A luncheon was arranged by the hostess, Dr. Martha Kilander, in the Wheat Room at the Waverly Hotel.

PENNSYLVANIA
Eastern Division

The regular meeting of the Eastern Division of the Chiropody Society of Pennsylvania was held at the Central Y. M. C. A. Building, Philadelphia, on July 8th.

The following officers were elected for the coming year: Chairman, Dr. Frank J. Carleton; Secretary-Treasurer, Dr. Catherine Fritz; Board of Trustees, Dr. Ray Dougherty; Members of Council, Drs. C. G. Carpinelli, Elizabeth Bieler, and Anne McCarthy.

The application of Dr. Samuel Shuster for active membership was unanimously accepted.

A large delegation from Pennsylvania will attend the Detroit Convention.

PENNSYLVANIA
Lehigh Valley Division

On Monday, July 14th, an enthusiastic group of chiropodists from Eastern Pennsylvania met at Easton and formed a new division in the Keystone State. The group were addressed by Dr. C. Gordon Rowe, of Philadelphia, President of the Pennsylvania Society, and Dr. Frank Carleton, editor of the Pennsylvania Chiropody Bulletin.

The following officers were elected: Chairman, Edgar Brown, of Allentown; Secretary-Treasurer, Vera Scott, of Lansford; Member of Board, Edmund Fairer, of Easton; Members of Council, Edward Ryback, Emma Ricker and Gertrude Richards.

The next meeting of the new Division will be held on August 11th, at Reading.

UTAH

The Utah State Association of Chiropodists held their regular monthly meeting July 10th, in the form of a banquet at the Newhouse Hotel in Salt Lake City. After dinner we were honored by a lecture on "Focal Infection and Oral Hygiene," by Dr. S. S. Burnham, a prominent Salt Lake dentist. The lecture and demonstrations as given by Dr. Burnham, were very interesting and instructive. He was able to show the close relation of focal infection with chiropody work, and any member that was not present surely missed a treat. After the lecture we decided we needed another honor member, along with Dr. Mark Brown, who is an X-ray specialist, so we elected Dr. Burnham. One of the largest meetings we have ever held was the one of July 10th, and we expect to have record attendance at all of our meetings from now on. Meeting adjourned, to be called again September 14th, at Provo, dispensing with the August meeting as several members will be on their vacations.

WEST VIRGINIA

The sixteenth annual meeting of the Chiropody Society of West Virginia was held at Parkersburg, June 1st and 2nd. Dr. W. C. Viehman presided.

The regular business session was held on Monday morning, June 2nd. Dr. Amick, of Charleston, was made Chairman of a committee to go before our Legislature and change our law

to four years of high school instead of two, in order to make our requirements standard with other States.

Dr. W. C. Viehman, of Huntington, was re-elected President for the sixteenth time.

Monday afternoon a clinic was held at the Logan Memorial Home for Children. Fifty children between the age of 12 and 19 were examined and treated. The following members assisted at the clinic: E. K. Crosby, G. C. Backus, E. H. Amick, P. S. Leachman, W. C. Moorman, and A. H. Schanz.

PHI EPSILON DELTA

In accordance with the custom established two years ago of holding a fraternity reunion at each annual State Convention, alumni members of Phi Epsilon Delta held their second annual breakfast gathering at 9:00 A. M., on Saturday, May 31st ,at the Hotel Oakland, Oakland, Calif., with Dr. Rhoades, graduating senior student, presiding.

Alumni members present were Drs. Harry B. Banks, George W. Scherer Jr., Harold M. Hogan, Alvin W. Agnew, F. J. Knott, L. D. Bucher Jr., Dr. King, Ray E. White, George Earle Whitten.

Honorary members present were Drs. James C. Morse, Harry H. Goodson. Lee Martindale, Edwin Craw, H. J. Riegelhaupt.

Others included Dr. Donald F. Kimball, newly-elected State President, and Dr. William G. Herrick, of Santa Barbara.

Two new honorary members of Phi Epsilon Delta, Drs. Riegelhaupt and Martindale, of Oakland, were introduced and expressed their appreciation of the honor bestowed upon them.

Members of this fraternity who reside outside of the confines of the State of California will be pleased to learn that their progress was discussed and the desire expressed that next year's National Convention be held in the City of Los Angeles, thus affording all alumni members of Phi Epsilon Delta wherever located to get together in the social activities to be planned by the fraternity for the benefit of delegates and their friends.

Most State societies are resting during the warmer months, but will open with new vigor in the early autumn. There is a busy fall and winter ahead.

BLOOD FLOW IN THE EXTREMITIES OF PATIENTS WITH HEART DISEASE

Physicians have long known of the pallor of aortic insufficiency and of the "languor of the arterial circulation causing the extremities and surface to be chilly" in heart failure. The recent interest in peripheral blood flow led to the discovery that in aortic regurgitation the skin may be flushed and warm and that rapid blood flow in the limbs may be present in spite of circulatory embarrassment. Many observers have estimated the flow through the limbs by inference from the gas content of the venous blood, not by the more direct plethysmographic method. It probably is permissible to assume that the metabolism of resting limbs is fairly constant and that the amount of oxygen removed from each unit of blood passing through the capillaries varies inversely as the total volume of flow. Large differences in oxygen content of arterial and venous blood therefore indicate that only a small volume of blood is passing through the limb. In 136 normal persons the arteriovenous oxygen difference in the arm averaged 4.8 per cent by volume. There is little difference in gas content of arm and leg vein blood of normal persons at rest. However, the difference in arteriovenous oxygen of normal persons ranged from 2.5 to 9 per cent by volume in a series tabulated by Rabinowitch, indicating that it is hazardous to draw conclusions as to cardiac output from the gas content of arm vein blood. The range of normal cardiac output or of basal metabolism is only one-fourth as great as the variation in blood flow of the resting limb. Environmental temperature, an important moderator of flow in the limbs, has little effect on cardiac output. Therefore, observations on blood from the arm or the leg should be interpreted in terms of local, not general, blood flow. Because of the wide normal range, one must be cautious in the interpretation of small variations in disease.

Grant, at the Peter Bent Brigham Hospital, Boston, was one of the first to point out that blood flow in the arm might be rapid in patients with cardiac failure, at the time when clinical improvement was beginning. In five patients he noted that oxygen

(Continued on Page 34.)

LOW VOLTAGE CURRENTS IN ELECTROTHERAPY

NORMAN E TITUS
NEW YORK

The low voltage currents used today in electrotherapy are, first, the plain galvanic, as obtained from batteries or generators; second, the alternating current, and, third, the faradic current.

The first two have many variations, and are made by most machines, but the last one is gradually falling into disuse, since the variations of the other are more reliable than the old-fashioned faradic. The faradic current cannot be measured, and as the mechanism for forming this current is so liable to all sorts of conditions that will vary the current generated, the uses of the faradic current are becoming less.

The galvanic current always has its polar chemical effects whenever used, the action of each pole being opposite to the other. When these effects are desired, no source excels the current from a battery. When the direct current from a generator is used, it is really a current of 1,950 interruptions a second, and although it can produce chemical effects, the interruptions also cause a powerful stimulating effect. This is advantageous, especially in the treatment of flaccid or paralyzed muscles when the combination of stimulation and the chemical effect on the nutrition make up the ideal treatment.

This "pulsating direct current," as it is called, can be converted into a smooth, battery-like current by putting condensers into the circuit which "iron out" the rough, interrupted current. It is not necessary to go into an explanation of what condensers do, for they are used so much in radio today, if one does not know, any modern boy can explain it, for most of them know more than their parents about condensers in an electrical circuit.

Of course, it is not necessary to use only this pulsating direct current for stimulating the contractions and nutrition of muscles. The ordinary direct current can be interrupted at any rate desired, and bring about the same reaction. These interruptions can be done by hand, or by mechanical interrupters, but they are only variations that are used by the individual operators, some in favor of one speed, and others bitterly opposed to that speed, and strong for a slower or faster rate.

The Morse wave generator produces both pulsating direct current, and then, by using condensers, also produces a smooth galvanic current. The strength of both of these currents can be controlled and made to vary in surges in any way the operator chooses. But this machine does not produce a true sinusoidal current.

The sinusoidal current used in electrotherapy today is a galvanic current, preferably the smooth type which alternates in polarity in each electrode. In the Morse wave generator the polarity is never reversed when the pulsating direct or galvanic (smooth) current is used. The advantage of the sinusoidal current is that the slow, stimulating effect of galvanism is obtained without any resulting polarity effects, because one wave directly counteracts the effects of the preceding one.

What are these polarity effects? Briefly, they are as follows: Remember, whatever the anode or positive pole does is directly opposite to the effects of the cathode, or negative pole. The experiment for testing polarity, using salty water and putting in two wires, is well known. The

negative pole (cathode) always causes the formation of twice as many bubbles of gas as are formed at the positive pole. Why?

All of the chemical actions of galvanic electricity depend upon particular characteristics of this current, best demonstrated by Faraday's ice pail experiment. This experiment showed that like-charged bodies repel each other, and unlike attract. Therefore, in the experiment to find out the polarity of a given current, the electrically positive hydrogen is repelled by the positive wire, and attracted to the negative wire, where it is released. The oxygen travels in the opposite direction and is released at the positive pole at the rate of one atom of oxygen to two of hydrogen. Hence double the amount of hydrogen bubbles show at the negative pole.

The same thing happens when the galvanic current passes through tissues. Nacent oxygen is released at the positive pole, and, consequently, there occurs an antiseptic action where positive galvanism is used. The positive pole is sedative to irritated nerve endings because it causes constriction of tissue and arteries. The vasoconstriction quality of the positive current makes it useful for haemostasis, and as a means of causing decongestion. Due to this constricting action on tissue, causing also lessened blood supply, the positive current does not promote nutrition.

In this process, known as "anaphoresis" (electrophoresis with the positive pole), use of the positive pole is made to repel electropositive chemicals and metals, and to attract acids.

Remembering that the cathode or negative pole does the opposite to the positive, reference to the paragraph above will show what the negative pole does. It has no antiseptic action, it irritates and increases pain, and it causes softening of tissue because the release of hydrogen causes the formation of more water in the tissue. It causes vasodilatation, favoring hemorrhage, increasing congestion, and, when wanted, the action can be used to increase local nutrition.

It is not the place of this paper to list the indications and contraindications for the uses of galvanism. Knowledge of the pathology presented, and the above-mentioned polar effects on this current enable any physician to figure out when galvanism is useful—if he wants to take the trouble.

The Morse wave generator, which it has been especially requested to discuss in this article, not only generates the two currents mentioned above, but it also creates an alternating current mentioned in the first paragraph. This current is not the ordinary sixty-cycle commercial alternating current that used to be labeled "sinusoidal" on high frequency machines. A sixty-cycle alternating current is therapeutically useless, as it is not fast or slow enough; it is just in the useless range. The alternating current generated by the Morse wave generator is three times as fast as ordinary alternating current, *i. e.*, one hundred and eighty cycles a second.

It has been found that this speed of alternation makes the current sufficiently powerful to penetrate through slight resistances, and still the current is not too fast in its change of polarity to lose its ability to stimulate motor nerves, causing muscular contractions. This current is ideal in causing muscular exercise of flaccid muscles, especially those which are so from disuse. The alternating characteristic of this current enables

it to penetrate through the abdomen and cause contractions of intestinal muscles. Ordinary galvanism will not do this in moderate doses, as the galvanic current always prefers to take the path of least resistance, and hence, in the abdomen will pass around the abdominal cavity via the external muscles or peritoneum.

The strength of this current can be varied as desired in the Morse wave generator. That is, the amplitude of the waves can be increased and decreased at will, according to the cam inserted in the control mechanism. But the speed of oscillations is always the same while the motor speed remains—as it should—constant.

Much confusion is brought about by the persistence of manufacturers in arranging their machines for all sorts of fancy, and useless, variations of the basic galvanic, faradic, or alternating currents. Salesmen are wont to dwell at length on the clinically worthless, and to the prospective buyer, mysterious variations of these fundamental low voltage currents. The galvanic is the most useful when used as a smooth battery current and can be interrupted at any rate desired. It can be made to alternate its polarity slowly, so that no polarity effects result, and then it is known as the sinusoidal current. When the speed of alteration is quickened to greater than sixty per second, it requires an added characteristic over the sinusoidal, in that it only causes muscular contractions. The faradic current, as stated before, is slowly dropping out of use in these days of exact electrotherapeutics, but it can be used for muscular stimulation.

40 EAST 41ST STREET.

A BUSY DAY WITH THE GALVANIC CURRENT

E. W. CORDINGLEY, A. M., D. C. O.
CLINTON, IND.

The first patient this morning complains that he ran a rake tine into the sole of his foot a week ago, and although the healing process seems to be well established, as a result of using a "family salve," the scar is causing a distinct contraction of the plantar tissues, with a resultant "tight feeling." It is apparent, upon examination, that the cicatrix is too hard and contracted. The negative pole of the galvanic current is, therefore, attached to a small pad electrode, and applied directly to the scar. The circuit being completed by means of a larger felt pad electrode on the dorsum of the foot. Five milliamperes of current are used for twenty minutes, when a gratifying relaxation of the scar tissue is evident. Two or three such treatments will cause the lesion to heal naturally, with practically no contraction of surrounding tissues.

After treating a surgical case, patient No. 2 is found to be suffering with a gouty great toe. It is too swollen and painful to wear a shoe, and he comes in with his foot wrapped in a towel, keeping his weight off it by the use of a crutch. The galvanic current can be of the greatest assistance here, so some absorbent cotton is soaked in a 3% sodium salicylate solution, and wrapped around the painful toe. A piece of block tin is then applied over the absorbent cotton, and a connecting cord is attached to the block tin at one end, and to the negative pole of

the galvanic machine, at the other. The current is turned on to three milliamperes, after the circuit has been completed by applying the positive electrode to the calf muscles, and after a thirty-minute treatment, the swelling is much reduced, and much of the pain has disappeared. The patient will return tomorrow for a similar treatment, which will be followed by passing a mild sinusoidal current through the affected member. Previous experience assures us that the cure by this means will be rapid and pleasant.

Patient No. 3 has an infected soft corn. An M. D. has been tryng out three kinds of ointments, without avail; so it is decided to try the galvanic current. A metal electrode, with a small spherical copper end, is attached to the positive pole of the machine, and about one and a half milliamperes of current is used for five minutes, holding the copper tip firmly against the infected area. A greenish discoloration ensues, and what is known as copper cataphoresis has been accomplished. The copper ions are a powerful germicide, so only a bland, protective dressing is required. As this method has been eminently successful in previous cases, we have high hopes for success in this one.

In the afternoon, after attending to some of the more usual chiropody cases, a lady comes in who has a corn on the medio-distal phalangeal articulation of the second toe. It has been excised a number of times, but the relief afforded is slight, and of short duration. It is recognized as in reality a synovitis, of which the surface callus is merely an extension of the inflammation. A platinum wire is therefore attached to a needle holder, and attached to the negative pole of the galvanic apparatus, and somewhat less than half a milliampere of current is passed. The current is frequently turned off by means of the rheostat during the treatment, and when it is apparent that resolution in the joint capsule is complete, the treatment is terminated, and an emollient dressing is applied.

A serous infiltration on the external aspect of the foot over the peroneal tubercle, accompanied with marked swelling, has brough a patient to the foot specialist's office later in the afternoon. It is apparent that it is a sequela of a sprain. A felt pad electrode, of a size to cover the area, is, therefore, soaked in a saturated potassium iodide solution, and connected with the negative pole. The circuit is completed with the positive electrode on the calf muscles, and ten milliamperes of galvanic current is used, followed by a sinusoidal current as strong as the patient can comfortably bear. At the end of the treatment, the swelling is markedly reduced.

This one day with the galvanic current has by no means presented every type of case in which galvanism is of value. Perhaps before the week is out we will have occasion to introduce other drugs, and chemicals into the tissues by means of galvanic ionization. And we are likely to use zinc sulphate, lithium chloride, sodium chloride, copper sulphate, or silver nitrate solutions in a similar manner. The galvanic current is a useful ally in chiropodial practice, and the facility with which chemical elements can be carried into the tissues by its use commends this modality to every progressive practitioner.

THE MUSCULAR SYSTEM AS A CAUSATIVE AND A CONTRIBUTING FACTOR IN DEFORMITIES OF THE HUMAN SKELETON

(Continued from Page 19.)

tance or extent of movement. In this connection it is important to notice two facts in the working of muscles: First, that the force a muscle can exert depends on the number and size of its fibres; second, that the extent through which it can contract depends on the length of its fibres. It follows from the first that the strength of muscles is proportional to their cross section, with the understanding that this cross section is taken at right angles to the fibres and includes all of them; the second is related to the fact that a muscle fibre can contract to half its full length. It has been found that human muscle in good condition can exert a force of six kilograms per square centimetre of cross section, which is practically the same as eighty-five pounds to the square inch.

A muscle that has eight square inches of cross section and fibres six inches long should, therefore, do 170 foot pounds of work at a single contraction.

Another important point which has direct bearing upon the force and distance of the muscle contractions is the internal structure of the muscles, whether the fibres run longitudinally or are penniform, modified somewhat by the variations. The longitudinal is the simpler of the two types; in its simplest form it can be well illustrated by the pronator quadratus in the forearm just above the wrist. This muscle consists of a single flat sheet of parallel fibres extending across the forearm, joining The radius on the outside and the ulna on the inside, covering a space about two inches square. This gives us fibres two inches long, and, therefore, able to contract through about one inch of distance.

It is, therefore, obvious that before a surgeon can decide upon a method of transplanting tendons in order either to reinforce a partially paralyzed muscle or to replace a paralyzed muscle by a well functioning muscle, he must determine, first, the nature of the muscle to be transplanted, whether it is normal, semi-normal, or paretic; second, the amount of pull which the muscle to be transplanted is called upon to do in its original situation and what is required of its newly planned position. The difference between the proper and the improper selection of the muscle to be transplanted is the difference between success and failure.—*Medical Journal and Record.*

BLOOD FLOW IN THE EXTREMITIES OF PATIENTS WITH HEART DISEASE

(Continued from Page 28.)

utilization was 5.3 per cent by volume when the patients were much distressed, but only 2.5 per cent by volume a few hours later, following venesection or thoracentesis. In other words, flow in the arm more than doubled when the condition of the heart and circulation was improved, although it had previously been slower than the average rate. Later others reported occasional high volumes for blood flow through the arm in heart failure, but the usual determination was the reverse. In Rabinowitch's ten cases the average utilization was 11 per cent by volume, so that the flow was presumably less than half the normal volume. The decrease in flow is due to vasoconstriction to maintain normal blood pressure in spite of a decreasing cardiac output. With a failing heart, flow in the limbs is probably decreased more than that in more vital areas, and when the cardiac condition is improved and the vasomotor tone decreases, flow through the extremities increases more than elsewhere to compensate for the more profound previous asphyxia.

Recent evidence proves that the same variations from abnormally slow to abnormally rapid flow may be observed when an alteration of the circulation of a limb is due, in part, to local causes. De Takats found that the blood was distinctly diminished in the dependent legs of patients with varicose veins (plus edema in some cases). Blalock apparently found decreased oxygen utilization, that is, greater blood flow than normal, in femoral veins of semirecumbent patients with varicose veins. Harrison and Pilcher analyzed femoral vein blood from semirecumbent persons and reported a normal arteriovenous difference of 5.8 per cent by volume, but 6.5 per cent cardiac failure without edema, 5.8 per cent with moderate, and 6 per cent with marked edema. In general, the blood flow was therefore decreased in heart failure. When they omitted the patients who had acidosis or digitalis intoxication, they found that there was a lower utilization with moderate and

(Continued on Page 36.)

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AMOLIN is an old friend among chiropodists. No doubt you know how amazingly effective it is for banishing unpleasant foot odors.

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A number of persons habitually troubled by sore, tired feet were instructed to sprinkle Amolin into the right shoe before putting it on in the morning. The right shoe only, mind you—not the left.

At the end of the day, every person making the test noted an amazing difference. The right foot wasn't so tired, they said. The usual soreness and itchiness was gone. It felt cooler, so comfortable.

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the pleasant deodorant powder that assures foot comfort, too

BLOOD FLOW

(Continued from Page 34.)

with marked edema (5.1 and 4.5 per cent by volume, respectively). In such small series one hesitates before accepting as significant variations of the average as small as 25 per cent, since the normal subjects vary by 500 per cent (from 2.5 to 12.5) and the abnormal by 1,000 per cent (from 0.83 to 9). Yet there is a suggestion that, with the more favorable condition of reduced venous pressure in the semi-recumbent individual, blood flow in the edematous leg may be greater than in the normal. It certainly exceeds that in edema-free extremities of cardiac patients, thus approaching the condition in the arm after relief of serious cardiac embarrassment, and in the varicose extremity after elevation. The work of Lewis and Grant indicated that the increase in blood flow above normal, observed when local circulatory obstruction was released, varied in duration with the degree and duration of the obstruction. With the marked tissue alteration noticeable in patients with varicose veins, or evidenced by edema, such a "reactive hyperemia" might last for hours or days when the limb was elevated. It is possible that the rapid blood flow evoked by edema, like that due to warmth or to infection, persists even when the leg is dependent. This has not been demonstrated, and analogy with the varicose leg suggests that it is not present in edematous legs until venous pressure is reduced. Since the difference in blood flow in edematous and nonedematous limbs is insignificant in camparison with the increase in flow in the arm when the circulation is improved by venesection, one may question whether edema is an effective stimulus for "reactive hyperemia."

Harrison and Pilcher did not consider the work of Grant or of de Takats; they concluded that edema increased blood flow through the tissues and were led to theorize as to the role of edema in the production of heart failure. They suggested that the usual view, that heart failure implies a diminished cardiac output, was erroneous. Contrary to the conclusion of Harrison and Pilcher, edema in heart disease can merely be regarded as a consequence and not as a con-

(Continued on Page 38.)

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BLOOD FLOW

(Continued from Page 36.)

tributing cause of heart failure. Its occurrence in dependent limbs, and the speed with which it may be absorbed when the limb is elevated, is evidence of the preponderant role of high venous pressure in the production of this edema. A reduction in venous pressure or an improvement in cardiac efficiency permits a normal or supernormal flow. Grant's observation of a doubling in blood flow in the arm after therapeutic bleeding for severe cardiac failure is another proof of the importance of reduction in blood volume in the therapy of the symptoms of cardiac failure. Nature's attempt to reduce blood volume by allowing fluid to escape into tissue spaces causes most of the symptoms of heart disease, and it must be remembered that heart failure is one of the disorders in which "a man may often with stricter propriety be said to die of his symptoms than to die of his disease."—Jour. A. M. A.

OBITUARY

Dr. Charles Koch

Died July 19, 1930.

Dr. Charles Koch, the dean of the profession in Georgia, and the first chiropodist in the State, died on Saturday, July 19th, at a private sanitarium in Atlanta.

Dr. Koch was born in Germany, came to Atlanta as a young man, where he early entered the practice of chiropody, which was maintained until failing health caused him to retire some few years ago.

For many years Dr. Koch was active in the work of the National Association of Chiropodists, but of recent years his health has made it necessary to lead a life of complete retirement, and has not been able to maintain his interest or his activity.

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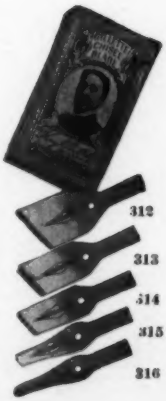

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